REMARKS

Claims 1, 2, 5-19, 21, 22, 24-40, 42 and 43 are pending in the application. Claims 1, 2, 5-19, 21, 22, 28-40, 42 and 43 are rejected. Claims 6, 7, 24-27 are objected to. Claims 1 and 21 are amended and are supported by the specification at page 4, lines 25-28, and at page 18, line 52, - page 19, line 4. Claim 6 is cancelled and claims 7 and 24 are amended for clarity. Claim 26 and the specification are amended to correct a typographical error. Applicants respectfully request consideration of the application in view of the foregoing amendments and the following remarks.

Applicants note the amendments to Claims 1 and 21 reintroduce the change in b* over time. This is explained in the specification at page 4, lines 25-28, and at page 18, line 31, - page 19, line 4, and is understood by those skilled in the art of colorimetry. "b*" is an axis of the CIELAB color scale, wherein b* is the color axis from yellow to blue, indicating "yellowness" of a color. CIELAB is a well-known tool for indicating color in a three-dimensional chart, indicating hue and shade. As defined at **http://www.colourware.co.uk/cpfaq/q3-21.htm**,

> CIELAB allows the specification of colour perceptions in terms of a three-dimensional space. The L*-axis is known as the lightness and extends from 0 (black) to 100 (white). The other two coordinates a* and b* represent redness-greeness and yellowness-blueness respectively. Samples for which a* = b* = 0 are achromatic and thus the L*-axis represents the achromatic scale of greys from black to white.

As defined in the specification at page 4, lines 25-28, and at page 18, line 31, - page 19, line 4, change in b* is defined as the change in yellowness on the CIELAB color scale under exposure to UV light. The start point of the change in b* would be the original color of a microbead as measured on the b* axis before exposure to UV light. The final color is a color achieved after exposure of the microbead to UV radiation. The examples in the specification were conducted in a time period of one week, with an amount of UV light approximating sunlight of 50 Klux, as set forth at page 18, lines 31-32. Thus, change in b*, or Δb^*, is clearly defined in the specification and claims 1 and 21 as the change in yellowness caused by UV exposure as measured on the CIELAB color scale. Further, method recitations have been removed from claims 1 and 21.

Rejection of Claims 6, 7, and 24-27 under 37 CFR 1.75(c):

Claims 6, 7, and 24-27 were objected to under 37 CFR 1.75(c), as being of improper dependent form. Claim 6 is herein canceled, and the dependency of claim 7 and claim 24 is amended. Reconsideration and withdrawal of the rejection are in order.

Rejection of Claims 1, 2, 5-7, 9-16, 21, 22, 28-35 and 39 under 35 U.S.C. 102(b)

Claims 1, 2, 5-7, 9-16, 21, 22, 28-35 and 39 are rejected under 35 U.S.C. 102(b) as allegedly anticipated by Maier et al. The Office Action mailed August 4, 2003, indicates Maier et al. teaches a shaped article such as a film, sheet, bottle (a container), tube, fiber or rod having a continuous first polymer phase having dispersed therein microbeads of a crosslinked second polymer that are bordered by void space, wherein the crosslinked second polymer is formed by monomers such as acrylic acid, methyl acrylate or methyl methacrylate (col. 7, lines 47-52 and Examples 15-18 and 23-26 and col. 17, lines 35-45), which comprise less than one wt% styrenic monomers. It is asserted in the Office Action that Maier et al. discloses microbeads of a composition claimed by Applicant, and thus that the microbeads of Maier et al. have the same thermal stability "in the absence of objective and convincing evidence to the contrary." Applicants respectfully traverse the rejection for at least the following reasons.

Applicants have recognized thermal stability and yellowness on exposure to UV light as problems in the area of shaped articles (*see* specification page 1, lines 4-8). Such problems are overcome by the claimed invention, wherein microbeads are used in formation of the article, the microbeads having less than 10 wt % styrenic monomers, a 2% weight loss at a temperature above 270°C, and Δb^* less than or equal to 0.2 after exposure to UV light (*see* independent claims 1 and 21). Applicants have found that use of microbeads that are thermally stable and resistant to yellowing produce shaped articles with like properties.

Maier et al. does not address thermal stability of the microbeads, and therefore does not recognize the problem of thermal stability in various formulations of microbeads. Further, although Maier et al. does recognize yellowing with time is a problem (col. 6, lines 1-2), exposure to UV light specifically is not noted for causing yellowness. As known to one skilled in the art, oxidation, cross-linking,

temperature, light, and humidity can all independently affect yellowness of a polymeric article.

Maier et al. does not teach use of less than 10 wt% styrenic monomers while maintaining thermal stability of the resultant microbead. Styrenic monomers such as divinlybenzene are exemplified at col. 7, lines 44-46, of Maier et al. as cross-linking agents, and are used in the examples. Tables 1, 2, 5, 6, 9, and 10 exemplify polystyrene as a cross-linker in an amount of either 5% or 30%. However, Maier et al. does not disclose the thermal stability of the microbeads having 5% polystyrene. Reducing the amount of styrenic monomer (polystyrene) to below 10% would result in a 2% weight loss at a temperature less then 270°C, as shown in the attached Declaration of Dennis E. Smith, previously submitted on November 4, 2003. As shown in the Declaration, a reduction of styrenic monomers alone results in weight loss at a decreased temperature. The use of 30wt % divinyl benzene results in a 2% weight loss at a temperature of 300°C, and the use of 10wt% divinyl benzene results in a 2% weight loss at a temperature of 260°C, as shown in the Declaration. Thus, reducing the amount of styrenic monomer reduces the stability of the microbead. As stated in the Declaration, extrapolating the trend shows that reducing the amount of styrenic monomer to less than 10wt% would result in a 2% weight loss at a temperature below 260°C. Thus, a microbead formed from a polymer including a styrenic monomer in an amount less than 10wt% would not have Applicants' claimed thermal stability, that is, a 2% weight loss above 270°C. Maier et al. therefore does not teach or suggest formulation of a microbead with less than 10 wt% styrenic monomers having a thermal stability of a 2% weight loss above 270°C.

As shown in Applicants' specification, the yellowness of the microbead and the thermal stability of the microbead have opposite trends with regard to the use of styrenic monomers. Applicants' examples in the specification further emphasize the difficulty in determining combinations of monomers and cross-linkers that result in a microbead having the desired thermal stability while maintaining the desired yellowness on exposure to UV radiation. Maier et al. does not teach or suggest appropriate combinations of monomers, or desired thermal stability and yellowness characteristics of microbeads resulting from the combination of appropriate monomers, which characteristics Applicants recognized and herein claim.

Maier et al. does not teach or disclose formation of a microbead of cross-linked polymer from monomers with less than 10 wt % styrenic monomers, wherein the microbead has a thermal stability of a 2% weight loss above 270°C, and a Δb^* less than or equal to 0.2 after exposure to UV light. For at least the above reasons, reconsideration and withdrawal of the rejection are in order.

Rejection of Claims under 35 USC §103(a):

Claims 18, 19, 37, and 38 are rejected under 35 U.S.C. §103(a) as allegedly obvious over Maier et al. for reasons set forth above in the rejection under 35 U.S.C. §102(b). It is asserted in the Office Action of August 4, 2003, that the concentration of crosslinking agent necessary to obtain a desired result can be determined by routine experimentation.

Claim 8 is rejected under 35 U.S.C. §103(a) over Maier et al. in view of Saito et al.

Claims 17, 36, 42, and 43 are rejected under 35 U.S.C. §103(a) over Maier et al. in view of Harrison et al.

Claim 40 is rejected under 35 U.S.C. §103(a) over Maier et al. in view of Hart et al.

Applicants traverse each of the above rejections under 35 U.S.C. §103(a) over Maier et al., alone or in combination with a secondary reference, for at least the following reasons.

As stated above with regard to the rejection over Maier et al. under 35 U.S.C. §102(b), Maier et al. does not disclose or suggest formation of a microbead of cross-linked polymer from monomers with less than 10 wt % styrenic monomers, wherein the microbead has a thermal stability of a 2% weight loss above 270°C, and a Δb^* less than or equal to 0.2 after exposure to UV light. Maier et al. does not recognize the problem of thermal stability, or the relation between the amount of styrenic monomer and yellowness. As shown in Applicants' specification, yellowness (Table 1) and thermal stability have inverse trends with regard to the amount of styrenic monomers.

Applicants have shown, in the attached Declaration of Dennis E. Smith, and in the specification, the unexpected results of improved thermal stability and decreased yellowness achieved with the claimed invention, which problems are not taught, suggested, or resolved in Maier et al., or in the secondary references of

Saito et al., Harrison et al., or Hart et al. Absent Applicants' claimed invention, both yellowness control and thermal stability cannot successfully be achieved by routine experimentation without undue trial and error. Applicants have determined and claim criteria which produce both satisfactory yellowness and thermal stability in a microbead. For at least the above reasons, reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a) are in order.

It is respectfully submitted, in view of the above amendments and remarks, that this application is now in condition for allowance, prompt notice of which is earnestly solicited. Should the Examiner have any questions or require anything further, the Examiner is invited to contact Applicants' undersigned representative.

Respectfully submitted,

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